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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/668,995

Applicant(s)

KOJIMA ET AL.

Examiner

Luke S. Wassum

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 September 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other: _____

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

A priority date of 17 November 1999, based on Japanese patent document 11-327483, has been established for the instant application.

Information Disclosure Statement

2. The Applicants' Information Disclosure Statement, filed 25 September 2000, has been received and entered into the record. Since the Information Disclosure Statement conforms to the provisions of MPEP § 609, the documents referenced therein have been considered. The examiner notes that only the English language abstracts of the foreign language references have been considered. See attached form PTO-1449.

Corrected Filing Receipt

3. The examiner acknowledges receipt of the Applicants' request for a corrected filing receipt. The requested correction (inclusion of foreign priority information) has been made.

Specification

4. The disclosure is objected to because of the following informalities:

The Brief Description of the Drawings is objected to, because it fails to describe each drawing in specific enough terms. The description of each drawing should be detailed enough to distinguish one drawing from another. See MPEP § 608.01(f) and 37 C.F.R. § 1.74.

There is a typographical error on page 10, line 12: "input side line handler 3" should be "input side line handler 2".

Appropriate correction is required.

5. The disclosure is objected to because of the following informalities:

In the Brief Description of the Drawings, the examiner notes that many drawing figures are described using identical broad descriptions. The Applicants are required to provide more specific descriptions such that each drawing has a distinct and clear description.

Appropriate correction is required.

Claim Objections

6. Claim 10 is objected to because of the following informalities:

The claim makes reference to a 'minimum address of a continuous empty area'. The examiner assumes that what is meant is the 'starting address'.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 4, 9, 10 and 12-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

9. Regarding claim 4, the limitation "...invalidity informer informing the invalidation of the pointer..." renders the claim indefinite, because it fails to disclose what/who is being informed.

10. Regarding claim 9, the limitation "...biggest address..." renders the claim indefinite, because addresses are pointers to data, and do not have the claimed characteristic of 'bigness'.

11. Regarding claim 10, the limitation "...each by the size of the continuous empty area..." renders the claim indefinite, because it is unclear what this limitation is meant to apply to, nor what the limitation is claiming.

12. Regarding claim 12, the limitation "...link information related to a link between data setting areas..." renders the claim indefinite, because the limitation fails to recite what precisely the link information is, but merely that it is 'related' to other data.

13. Regarding claim 13, the limitation "...information related to the use-condition ..." renders the claim indefinite, because the limitation fails to recite what precisely the information is, but merely that it is 'related' to other data.

Furthermore, the limitation "...information of the data setting area of a destination ..." renders the claim indefinite, because it is unclear what exactly the information is.

14. Regarding claim 14, the limitation "...on the basis of the frequency data ..." renders the claim indefinite, because the limitation fails to recite how the data setting area is chosen, and precisely what effect the frequency data has on this determination.

Claim Rejections - 35 USC § 102

15. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

16. Claims 15, 19 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Hitz et al. (U.S. Patent 5,819,292).

17. Regarding claim 15, Hitz et al. teaches a data management apparatus for managing a plurality of data which are used in order to execute an application program for providing services related to communication by a switching system, comprising:

- a) a data field storing the plurality of data, said data field is composed of a plurality of data setting areas, each data in said data field is stored by a single of plural data setting areas according to a size of data (see details of the inode structure, and how larger files are stored across multiple blocks and possibly multiple inodes, col. 5, line 60 through col. 6, line 52; see also Figures 4A through 4D);

- b) a data setting area management table storing information related to the use-condition of each data setting area (see disclosure of the block map and inode file, both of which provide analogous functionality, col. 9, line 50 through col. 10, line 48);
- c) an allocation controller referring to said data setting area management table, and determining at least one of empty data setting areas in order to allocate a data requested to be added (see disclosure that new data is only written to unallocated blocks, col. 4, lines 14-16); and
- d) an adder storing the data requested to be added to at least one of the empty data setting areas which is determined by said allocation controller (see disclosure that new data is only written to unallocated blocks, col. 4, lines 14-16).

18. Regarding claim 19, Hitz et al. teaches a method for managing a plurality of data which are used in order to execute an application program for providing services related to communication by a switching system, comprising steps of:

- a) storing the plurality of data into a data field, said data field is composed of a plurality of data setting areas, each data in said data field is stored by a single of plural data setting areas according to a size of data (see details of the inode structure, and how larger files are stored across multiple blocks and possibly multiple inodes, col. 5, line 60 through col. 6, line 52; see also Figures 4A through 4D);
- b) storing information related to the use-condition of each data setting area into a data setting area management table (see disclosure of the block map and inode file, both of which provide analogous functionality, col. 9, line 50 through col. 10, line 48);

- c) referring to said data setting area management table, and determining at least one of empty data setting areas in order to allocate a data requested to be added (see disclosure that new data is only written to unallocated blocks, col. 4, lines 14-16); and
- d) storing the data requested to be added to at least one of the empty data setting areas which is determined (see disclosure that new data is only written to unallocated blocks, col. 4, lines 14-16).

19. Regarding claim 23, Hitz et al. teaches a computer readable medium storing a program for managing a plurality of data which are used in order to execute an application program for providing services related to communication by a switching system, the program comprising steps of:

- a) storing the plurality of data into a data field, said data field is composed of a plurality of data setting areas, each data in said data field is stored by a single of plural data setting areas according to a size of data (see details of the inode structure, and how larger files are stored across multiple blocks and possibly multiple inodes, col. 5, line 60 through col. 6, line 52; see also Figures 4A through 4D);
- b) storing information related to the use-condition of each data setting area in a data setting area management table (see disclosure of the block map and inode file, both of which provide analogous functionality, col. 9, line 50 through col. 10, line 48);
- c) referring to said data setting area management table, and determining at least one of empty data setting areas in order to allocate a data requested to be added (see disclosure that new data is only written to unallocated blocks, col. 4, lines 14-16); and

- d) storing the data requested to be added to at least one of the empty data setting areas which is determined (see disclosure that new data is only written to unallocated blocks, col. 4, lines 14-16).

Claim Rejections - 35 USC § 103

20. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

21. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

22. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made

in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

23. Claims 1, 2, 16, 17, 20 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art in view of Koyama (Japanese Patent Publication 7-295814).

24. Regarding claim 1, the Applicants teach as Admitted Prior Art a data management apparatus for managing a plurality of data which are used in order to execute an application program for providing services related to communication by a switching system substantially as claimed, comprising:

- a) a data field storing the plurality of data (see data field in Figure 21, labeled as Prior Art; see also Applicants' specification, page 3, last paragraph through page 4, first paragraph);
- b) an address acquirer acquiring an address of the data in said data field for which an access is requested by the application program (see pointer acquisition step in Figure 21, labeled as Prior Art; see also Applicants' specification, page 3, last paragraph through page 4, first paragraph); and
- c) a lender lending the address of the data to the application program (see pointer lending step in Figure 21, labeled as Prior Art; see also Applicants' specification, page 3, last paragraph through page 4, first paragraph).

The Admitted Prior Art fails to explicitly teach a data management apparatus comprising a lending pointer table storing at least one of pointer records having the acquired address and a

pointer corresponding to the acquired address, and a lender reading out the pointer from the lending pointer table.

Koyama, however, teaches a data management apparatus comprising a lending pointer table storing at least one of pointer records having the acquired address and a pointer corresponding to the acquired address, and a lender reading out the pointer from the lending pointer table (see Constitution section, page 2; see also text of claim 1, beginning on page 2; see also paragraph [0016], beginning on page 10).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a lending pointer table for storing pointer records to the acquired address, since this would conceal the details of the address management mechanism from the application program, thus precluding a specific application from accessing data improperly (see text of claim 2, page 3).

25. Regarding claim 16, the Applicants teach as **Admitted Prior Art** a method for managing a plurality of data which are used in order to execute an application program for providing services related to communication by a switching system substantially as claimed, comprising:

- a) a data field storing the plurality of data (see data field in Figure 21, labeled as Prior Art; see also Applicants' specification, page 3, last paragraph through page 4, first paragraph);
- b) an address acquirer acquiring an address of the data in said data field for which an access is requested by the application program (see pointer acquisition step in Figure 21, labeled as Prior Art; see also Applicants' specification, page 3, last paragraph through page 4, first paragraph); and

- c) a lender lending the address of the data to the application program (see pointer lending step in Figure 21, labeled as Prior Art; see also Applicants' specification, page 3, last paragraph through page 4, first paragraph).

The Admitted Prior Art fails to explicitly teach a method comprising a lending pointer table storing at least one of pointer records having the acquired address and a pointer corresponding to the acquired address, and a lender reading out the pointer from the lending pointer table.

Koyama, however, teaches a method comprising a lending pointer table storing at least one of pointer records having the acquired address and a pointer corresponding to the acquired address, and a lender reading out the pointer from the lending pointer table (see Constitution section, page 2; see also text of claim 1, beginning on page 2; see also paragraph [0016], beginning on page 10).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a lending pointer table for storing pointer records to the acquired address, since this would conceal the details of the address management mechanism from the application program, thus precluding a specific application from accessing data improperly (see text of claim 2, page 3).

26. Regarding claim 20, the Applicants teach as Admitted Prior Art a computer readable medium storing a program for managing a plurality of data which are used in order to execute an application program for providing services related to communication by a switching system substantially as claimed, the program comprising the steps of:

- a) a data field storing the plurality of data (see data field in Figure 21, labeled as Prior Art; see also Applicants' specification, page 3, last paragraph through page 4, first paragraph);
- b) an address acquirer acquiring an address of the data in said data field for which an access is requested by the application program (see pointer acquisition step in Figure 21, labeled as Prior Art; see also Applicants' specification, page 3, last paragraph through page 4, first paragraph); and
- c) a lender lending the address of the data to the application program (see pointer lending step in Figure 21, labeled as Prior Art; see also Applicants' specification, page 3, last paragraph through page 4, first paragraph).

The Admitted Prior Art fails to explicitly teach a computer readable medium comprising a lending pointer table storing at least one of pointer records having the acquired address and a pointer corresponding to the acquired address, and a lender reading out the pointer from the lending pointer table.

Koyama, however, teaches a computer readable medium comprising a lending pointer table storing at least one of pointer records having the acquired address and a pointer corresponding to the acquired address, and a lender reading out the pointer from the lending pointer table (see Constitution section, page 2; see also text of claim 1, beginning on page 2; see also paragraph [0016], beginning on page 10).

It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate a lending pointer table for storing pointer records to the acquired address, since this

would conceal the details of the address management mechanism from the application program, thus precluding a specific application from accessing data improperly (see text of claim 2, page 3).

27. Regarding claims 2, 17 and 21, **Koyama** additionally teaches a data management apparatus, method and computer readable medium further comprising a reader receiving the lent pointer from the application program, reading out the address corresponding to the lent pointer from the lending pointer table, reading out the data storing the read address in said data field, and giving the read data to the application program (see Constitution section, page 2; see also text of claim 1, beginning on page 2; see also paragraph [0016], beginning on page 10).

28. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Admitted Prior Art** in view of **Koyama** (Japanese Patent Publication 7-295814) as applied to claims 1, 2, 16, 17, 20 and 21 above, and further in view of **Cabrera et al.** (U.S. Patent 6,029,160).

29. Regarding claim 3, **Admitted Prior Art** and **Koyama** teach a data management apparatus substantially as claimed.

Neither **Admitted Prior Art** nor **Koyama** explicitly teaches a data management apparatus including a deleter deleting a data from said data field, and a record deleter deleting the pointer record having the address of the data which is deleted by said deleter from said lending pointer table.

Cabrera et al., however, teaches a data management apparatus including a deleter deleting a data from said data field, and a record deleter deleting the pointer record having the address of the

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data which is deleted by said deleter from said lending pointer table (see disclosure of analogous functionality at col. 9, lines 26-38 and col. 10, lines 28-35).

It would have been obvious to one of ordinary skill in the art at the time of the invention to delete data and references to said data, since this is the only way for obsolete data to be removed from the system.

30. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Admitted Prior Art** in view of **Koyama** (Japanese Patent Publication 7-295814) in view of **Cabrera et al.** (U.S. Patent 6,029,160) as applied to claim 3 above, and further in view of **Hacherl et al.** (U.S. Patent 5,787,442).

31. Regarding claim 4, **Admitted Prior Art**, **Koyama** and **Cabrera et al.** teach a data management apparatus substantially as claimed.

None of **Admitted Prior Art**, **Koyama** nor **Cabrera et al.** explicitly teach a data management apparatus including an invalidity informer for informing the invalidation of the pointer in the pointer record which is deleted by said record deleter.

Hacherl et al., however, teaches a data management apparatus including an invalidity informer for informing the invalidation of the pointer in the pointer record which is deleted by said record deleter (see Abstract; see also col. 1, line 34 through col. 2, line 13).

It would have been obvious to one of ordinary skill in the art at the time of the invention to inform interested processes when a pointer record is deleted, since this allows the interested process to take appropriate actions to endure that referential integrity is maintained (see col. 1, line 34 through col. 2, line 13).

32. Claims 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Admitted Prior Art** in view of **Koyama** (Japanese Patent Publication 7-295814) as applied to claims 1, 2, 16, 17, 20 and 21 above, and further in view of **Hale et al.** (U.S. Patent 5,502,836).

33. Regarding claims 5 and 6, **Admitted Prior Art** and **Koyama** teach a data management apparatus substantially as claimed.

Neither **Admitted Prior Art** nor **Koyama** explicitly teaches a data management apparatus including a relocater for relocating data stored in said data field.

Hale et al., however, teaches a data management apparatus including a relocater for relocating data stored in said data field (see col. 2, lines 55-57), and an address updater detecting the address of the data which is relocated and updating the detected address to an address after the relocation process (see col. 2, lines 57-59), and wherein the address updater waits until any pending read requests of the data being relocated are completed (see disclosure that the relocation process waits for a lull in I/O before executing, col. 12, lines 10-64).

It would have been obvious to one of ordinary skill in the art at the time of the invention to provide the claimed relocation functionality, since this allows data to be reorganized on the disks such that it can be accessed more efficiently.

34. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Admitted Prior Art** in view of Koyama (Japanese Patent Publication 7-295814) as applied to claims 1, 2, 16, 17, 20 and 21 above, and further in view of Watson et al. (U.S. Patent 4,755,939).

35. Regarding claim 7, **Admitted Prior Art** and Koyama teach a data management apparatus substantially as claimed.

Neither **Admitted Prior Art** nor Koyama explicitly teaches a data management apparatus including a record deleter that performs garbage collection.

Watson et al., however, teaches a data management apparatus including a record deleter that performs garbage collection (see disclosure that the system detects when no more pointers to a given cell exist, and then performs garbage collection, freeing the cell (see Abstract, et seq.)).

It would have been obvious to one of ordinary skill in the art at the time of the invention to institute garbage collection, since it is important to provide some means of reclaiming cells which are no longer required, so that they can be re-allocated for further use (see col. 1, lines 21-23).

36. Claims 8, 18 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Prior Art in view of Koyama (Japanese Patent Publication 7-295814) as applied to claims 1, 2, 16, 17, 20 and 21 above, and further in view of Hitz et al. (U.S. Patent 5,819,292).

37. Regarding claims 8, 18 and 22, Admitted Prior Art and Koyama teach a computer readable medium, data management apparatus and method substantially as claimed.

Neither Admitted Prior Art nor Koyama explicitly teaches a computer readable medium, data management apparatus and method further comprising a data setting area management table, an allocation controller and an adder.

Hitz et al., however, teaches a computer readable medium, data management apparatus and method comprising a data setting area management table storing information related to the use-condition of each data setting area (see disclosure of the block map and inode file, both of which provide analogous functionality, col. 9, line 50 through col. 10, line 48), an allocation controller referring to said data setting area management table, and determining at least one of empty data setting areas in order to allocate a data requested to be added (see disclosure that new data is only written to unallocated blocks, col. 4, lines 14-16), and an adder storing the data requested to be added to at least one of the empty data setting areas which is determined by said allocation controller (see disclosure that new data is only written to unallocated blocks, col. 4, lines 14-16).

It would have been obvious to one of ordinary skill in the art at the time of the invention to implement a system of file space allocation mapping such as that claimed, since the operating system

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must have a way of accessing data for reading, and also must have to capability to write new data to memory/disk space that is unoccupied.

38. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Admitted Prior Art** in view of **Koyama** (Japanese Patent Publication 7-295814) in view of **Hitz et al.** (U.S. Patent 5,819,292) as applied to claims 8, 18 and 22 above, and further in view of **Hacherl et al.** (U.S. Patent 5,787,442).

39. Regarding claim 11, **Admitted Prior Art**, **Koyama** and **Hitz et al.** teach a data management apparatus substantially as claimed.

None of **Admitted Prior Art**, **Koyama** nor **Hitz et al.** explicitly teach a data management apparatus wherein the lender informs the application program that there is no data for which access is requested by the application program when the detected use-condition is under the condition of deleted.

Hacherl et al., however, teaches a data management apparatus wherein the calling application is notified when requested data has been deleted (see Abstract; see also col. 1, line 34 through col. 2, line 13).

It would have been obvious to one of ordinary skill in the art at the time of the invention to inform interested processes when a pointer record is deleted, since this allows the interested process

to take appropriate actions to endure that referential integrity is maintained (see col. 1, line 34 through col. 2, line 13).

Conclusion

40. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Korty (U.S. Patent 5,021,946) teaches a method for selecting the sizes and ordering of the extents used to construct a file, a segment, or a virtual space of a computer system file.

Eilert et al. (U.S. Patent 5,095,420) teaches a technique for mapping a data space to an address space.

Johnson et al. (U.S. Patent 5,175,852) teaches a distributed file management system with a plurality of nodes and a plurality of files.

McCrory (U.S. Patent 5,751,979) teaches a video controller that enables applications operating in a protected, multiprocessing system to update a video memory at native speeds.

Provino et al. (U.S. Patent 5,799,314) teaches a method of controlling the mapping of data buffers for heterogeneous programs.

Mori et al. (U.S. Patent 5,806,058) teaches a database management system for accessing data stored in a database via an index.

Tatsumi et al. (U.S. Patent 5,832,491) teaches a system for relocating records in a database having a prime region and an overflow region in parallel with a service processing.

Gladney (U.S. Patent 6,044,378) teaches a system for determining a relationship between a first and second data element by using a relationship element.

Saboff (U.S. Patent 6,199,203) teaches a system for managing the memory of a software component such that the state of the software component is preserved after an update to the software component.

Oguchi et al. (U.S. Patent 6,304,912) teaches a communication apparatus containing a first table having entries each storing a data-link-layer path to a second communication apparatus.

Forin (U.S. Patent 6,360,220) teaches a lock-free method of accessing information in an indexed computer data structure which includes a lookup procedure, an insertion procedure, a removal and replacement procedure and a release procedure.

Capps (U.S. Patent 6,397,311) teaches a system and method of defragmenting a file system.

Bohannon et al. (U.S. Patent 6,449,623) teaches a method of detecting and recovering from data corruption in a database.

Smith (U.S. Patent 6,516,329) teaches a method of handling a search through the use of a page index.

Yamada (Japanese Patent Publication JP410275082) teaches a system that dynamically generates an object on a computer across a network by making use of a remote procedure.

Kodera (Japanese Patent Publication JP02001005704) teaches a system for increasing the efficiency of data access by generating a data table of unique keys permitting direct access to data in a database that an application requires.

Jodeit ("Storage Organization in Programming Systems") teaches a system of program and data representation for use in a computer system.

Ben-Amram et al. ("On Pointers Versus Addresses") investigates the cost of random access to memory.

Buhr et al. (« μ Database : Parallelism in a Memory-Mapped Environment ») investigates the behavior of data structures and their algorithms, both parallel and sequential, in a memory-mapped environment.

The following reference, while not qualifying as prior art, is also of interest:

Choy (U.S. Patent 6,581,060) teaches a system for protecting records in a relational database . management system in accordance with non-RDBMS access control rules.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luke S. Wassum whose telephone number is 703-305-5706. The examiner can normally be reached on Monday-Friday 8:30-5:30, alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John E. Breene can be reached on 703-305-9790. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

In addition, INFORMAL or DRAFT communications may be faxed directly to the examiner at 703-746-5658.

Customer Service for Tech Center 2100 can be reached during regular business hours at (703) 306-5631, or fax (703) 746-7240.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


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